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FINAL REPORT ON FARMERS' STOCK PEANUT SHRINKAGE STUDY

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
FRUIT AND VEGETABLE DIVISION

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The author also wishes to thank Mrs. Sondra H. Johnson and Mr. David Karr for their capable assistance in the analysis of the data.

FINAL REPORT ON FARMERS' STOCK PEANUT SHRINKAGE STUDY (1958 AND 1959 CROPS)

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INTRODUCTION

The Federal-State Inspection Service inspects and certifies loads of farmers' stock peanuts with respect to percentage of foreign material, percentage of moisture, and quality level, including percentage of hulls, sound mature kernels (SMK), other kernels (OK) and other factors at the time the grower delivers his crop. Then, at some later date, after the peanuts have been in storage, many of the lots are inspected again to determine the percentages of the same factors. Experience has shown that these two inspection results may differ by more than the amount which could reasonably be attributed to sampling variations. As a consequence, the following study was made to determine and measure these "unusual" differences in order to provide more reliable inspection certifications to growers, shellers, warehousemen and the Commodity Credit Corporation of the U. S. Department of Agriculture. When this difference shows an unusual loss in percentage of SMK, it is said to be due to "shrinkage" of the kernels while in storage.

Another purpose of the study was to measure the weight changes of kernels and hulls during storage. This is important to the Federal-State Inspection Service as it provides information necessary to evaluate sampling reliability. If, for example, a 1,000-gram sample is used for inspection, there will be more peanuts by count in the 1,000-grams after storage (due to weight loss in the kernels) than before storage. This weight change, of course, is also very important for buyer-seller interests.

A third purpose of the study was to compare the percentage of SMK riding screens with official size openings (used by the Inspection Service) and the percentage of SMK riding screens with smaller openings. It has been suggested that screens with smaller openings might be used to compensate for any shrinkage in kernel size that may occur during storage.

A final purpose was to measure differences resulting from the hand-screening method used by the Inspection Service to obtain SMK and OK. This was done by inspectors shaking the kernels on hand-held screens and, of course, gave rise to some differences due to the human element. During the 1958-59 study the precision of the hand shaking method was measured and compared with results from a new mechanical screen shaking device. The mechanical shaker proved to be more reliable and, as a result, it was officially adopted by the Inspection Service in 1959. Therefore, this phase of the study was not continued in 1959-60 and no further report on it will be made.

PROCEDURE

Data in this report were obtained from the following groups of samples of farmers' stock peanuts from the 1958 and 1959 crops:

Type	Drying Method	State	No. of Samples	
			1958-59	1959-60
Virginia	Stacked	Virginia	159	248
Virginia	Stacked	North Carolina	129	135
Virginia	Mechanical	Virginia	7	52
Virginia	Mechanical	North Carolina	15	115
Virginia	Mechanical	Georgia	-	82
Virginia	Windrowed	North Carolina	6	-
Virginia	Windrowed	Georgia	22	78
Virginia Bunch	Windrowed	Georgia	-	39
Runner	Stacked	Georgia	19	-
Runner	Stacked	Alabama	68	188
Runner	Mechanical	Georgia	7	77
Runner	Mechanical	Alabama	-	113
Runner	Windrowed	Georgia	300	162
Runner	Windrowed	Alabama	145	149
Spanish	Stacked	Georgia	33	-
Spanish	Mechanical	Georgia	21	161
Spanish	Mechanical	Texas	40	55
Spanish	Mechanical	Oklahoma	-	100
Spanish	Windrowed	Georgia	73	152
Spanish	Windrowed	Texas	197	246
Spanish	Windrowed	Oklahoma	43	182

Samples were examined by inspectors of the Federal-State Inspection Service in the Southeastern, Southwestern, and Virginia-Carolina areas.

The general instructions for handling the samples and recording the data were as follows:

1. Prepare 250 grams of cleaned farmers' stock peanuts for each sample, as soon as possible after it has been delivered to the testing location.

2. Shell the sample and make Steinlite moisture test on kernels according to the standard method, using the same Steinlite instrument for every test on every sample.

3. Weigh hulls.

4. 1958-1959: Screen the sample in alternating order on each of three screens (14, 14-1/2, and 15 for Spanish and Virginia, and 15, 15-1/2 and 16 for Runner). In 1959-60 the screens used were 14-5/8, 14-3/4 and 14-7/8 for Spanish, and 15-3/4 and 15-7/8 for Runner. This step was omitted for the Virginia type in 1959-60.

5. For each of the three screens used, obtain separately the weight of kernels riding and passing through the screen.

   NOTE: For the Virginia type, the sample also was screened on a 21-1/2 screen and the "extra large" kernel weight recorded.

6. Store kernels and hulls in 3-pound sacks until ready for next tests. Storage should approximate commercial conditions.

Steps 2 through 6 (with the exception of shelling) were repeated, after the first day, at predetermined intervals of time in storage as follows:

Days in storage

1958-59: 2, 3, 5, 9, 17, 33, 50, 65

1959-60: 33, 65, 97

Results of the 1958-59 study indicated the need for more data at 65 and 97 days after storage, so for 1959-60 the shorter times in storage were eliminated and the 97th day added.

Each State collected samples varying in moisture content in the range of 4 to 20 percent, with the majority ranging from 6 to 11 percent moisture. In view of the relatively small number of samples above 10 and below 4.5 percent moisture and their erratic behavior, they were not used in the final analyses of this study. Therefore, no conclusions should be applied to peanuts with moisture outside the 4.5 to 10.0 percent range.

The data were analyzed for each State, type of peanut, and drying method separately, since it was suspected these sources might have different effects on the peanuts.

Kernel defects were not scored during any of the tests. Therefore, the changes in SMK given in this report do not include any additional changes in SMK that may occur due to damage or defective kernels.

Samples used in these studies were held in storage in the shelled stage. Duplicate unshelled samples were retained in connection with one-fourth of the shelled samples to compare the effect of storage on the peanuts in and out of the shell. These unshelled samples were stored in the same location, and were tested on two of the same days that the corresponding shelled samples were re-tested. This was done on the 17th and 33rd days of storage during the 1958-59 season, and on the 65th and 97th days of storage during the 1959-60 season.

FINDINGS

Data on percent moisture, percent hulls, percent SMK, percent OK, and total weight, averaged for each of the various groups of samples, are listed in Tables 1 through 4 in the Appendix. Total weight is the weight of kernels and hulls measured in grams.

Moisture Change. The length of time peanuts are kept in storage does not directly affect the percentage of Hulls, SMK, and OK. The most important factor is the moisture change in the peanuts. Any decrease or increase in moisture of the peanuts during storage has a related effect on the percent of SMK, OK, and Hulls. Length of storage (aside from insect damage or deterioration) is important only to the extent it affects the moisture content of the peanuts. This is also true with respect to change of weight in the peanuts. Therefore, the results given in this report can be applied to farmers' stock peanuts regardless of their time in storage provided the moisture change is known (i.e. the difference between the moisture of the peanuts going into storage and coming out of storage).

Moreover, it is the change in moisture rather than the actual moisture level that is important. For example, if a sample measured 8 percent moisture before storage and 6 percent moisture after storage, the difference of 2 percentage points is the significant factor. The same results could be expected if the change had been from 9 to 7 percent or from 7 to 5 percent.

Other factors which did not directly influence the changes in Hulls, SMK and OK significantly were temperature of kernels before storage, temperature of kernels after storage, and the original percentage of kernels riding the screen.

The different types of drying methods used on the peanuts (windrowing, stacking, and machine drying) seemed to affect the changes in storage, but the nature and extent of such were not predictable in this study.

The results that follow are based on averages of 16 or more 250-gram samples. That is, each plotted point on Charts 1 through 5 represents an average of at least 16 samples. However, in practice, frequently as many as 300 samples of farmers' stock peanuts are used to determine the average moisture and SMK of peanuts going into and coming out of a particular warehouse. If the averages in this study were based on approximately 300 samples, as is done in practice, one would expect the charts to show less variation of the points from the curves.

The Virginia Bunch type peanuts from Georgia acted similarly to Runner type peanuts. They have been plotted on the Runner charts for informational purposes, but were not included in any of the statistical calculations used to obtain the regression lines in the charts for Runners.

Change in Total Weight During Storage. The change in total weight of farmers' stock peanuts (i.e., the weight of hulls plus kernels) is in a one-to-one ratio (linear) with respect to change in moisture of the peanuts. Chart 1 shows that for each one percentage point loss in moisture during storage there is one percentage point loss in weight of the peanuts. This is also true for the unshelled check samples. They follow exactly the same straight lines shown in Chart 1. A minus change means loss of weight or moisture during storage.

The equations for the lines in Chart 1 and their statistical measures are given in Table 5.

Change in Percentage of Sound Mature Kernels, Other Kernels, and Hulls During Storage.

Sound Mature Kernels (SMK). The data for two seasons show that SMK will decrease in percentage points if there is a decrease in moisture of the peanuts during storage. This loss in SMK is in addition to any weight loss of the peanuts. In other words, peanuts that lose moisture during storage will weigh less and also will have a lower percent SMK content.

The average amounts of change in percent SMK for the indicated changes in moisture are shown in Chart 2. The relationship between SMK change and moisture change in curvilinear; that is, the amount of SMK loss is proportionately greater as the moisture loss increases. A minus on Chart 2 indicates a loss in percentage points of SMK or moisture during storage.

The amount of loss in SMK is different for each type of peanut, as shown in Chart 2. Differences in the amount of loss as related to drying methods also were evident in some instances, but were generally not large enough to provide a reliable basis for establishing a separate rate of loss. In fact, the difference in amount of SMK loss from State to State for the same type peanut sometimes was greater than the difference in amount of loss between drying methods within a State.

The unshelled duplicate samples are included in the plottings and regression equations for all factors. Aside from sampling errors, they behave similarly to the peanuts stored with the shells removed.

The equations for the curves in Chart 2 and their statistical measures are given in Table 5.

Other Kernels (OK). As would be expected, the amount of other kernels increases in percentage points during storage when there is a decrease in moisture of the peanuts. For all practical purposes, a change in SMK during storage is accounted for by an opposite change in OK. That is, if moisture decreases during storage, SMK will decrease, and OK will increase to within 0.1 percentage point of the amount loss in SMK. The 0.1 percentage point difference is accounted for by Hulls.

The average amounts of change in percent OK for the indicated changes in moisture are shown in Chart 3. The equations for the curves in Chart 3 and their statistical measures are given in Table 5.

Hulls. The percent Hulls changes very little, if any, during storage. Regardless of type of peanut or amount of moisture loss, the Hulls gain about 0.1 percentage point during storage when there is a loss in moisture.

The average amounts of change in percent Hulls for the indicated changes in moisture are shown in Chart 4. The equations for the curves in Chart 4 and their statistical measures are given in Table 5.

Unofficial Screen Sizes. Screens with smaller openings than those in the prescribed standard screens were used in comparison with the standard screens to size the peanuts coming out of storage. Assuming kernels shrank during storage, the objective was to find a "smaller" screen that would result in the same percent of kernels riding the screen after storage as rode the official size screens before storage.

The smaller screen openings used in 1958-59 for out-of-storage measurements (14/64 and 14.5/64 for Spanish and Virginia; 15/64 and 15.5/64 for Runner) gave higher percent SMK after storage than did the official size screen before storage. Therefore, in 1959-60, screens with 14-5/8, 14-3/4 and 14-7/8 sixty-fourths openings were tried for Spanish peanuts; and 15-3/4 and 15-7/8 sixty-fourths size screens for Runner peanuts. These tests were not conducted on the Virginia type peanuts in 1959-60.

Charts 6 through 11 show the correlation between the weight of kernels actually riding the screens with smaller openings after storage and the "ride weight" required after storage to give the same percent SMK that the sample had before storage. The "ride weight" required after storage was calculated for each sample by multiplying the original percent SMK of the sample times the total weight of the sample after storage. This calculation was necessary to compensate for changes in the total sample weight due to moisture changes during storage. The fact that this calculated "ride weight" does not equal the actual ride weight after storage on the official size screens further supports the conclusion that the kernels change more than can be accounted for by the effect of moisture on weight.

The straight lines on charts 6 through 11 indicate where all points would fall if there was perfect correlation. When the majority of points are above this line (as in charts 7 and 8) it means the actual weight of kernels riding the 14-7/8 slot screen after storage is higher than the ride weight needed to obtain the same percent SMK as the sample had before storage. When the majority of points are below the line, the opposite is true.

The charts include screens giving the best correlations. Data on other screens sizes tested are not plotted. In general, the use of screens with smaller size openings would help compensate for SMK changes in storage. However, this method would not take into consideration small versus large moisture losses in storage as do charts 2 thru 5.

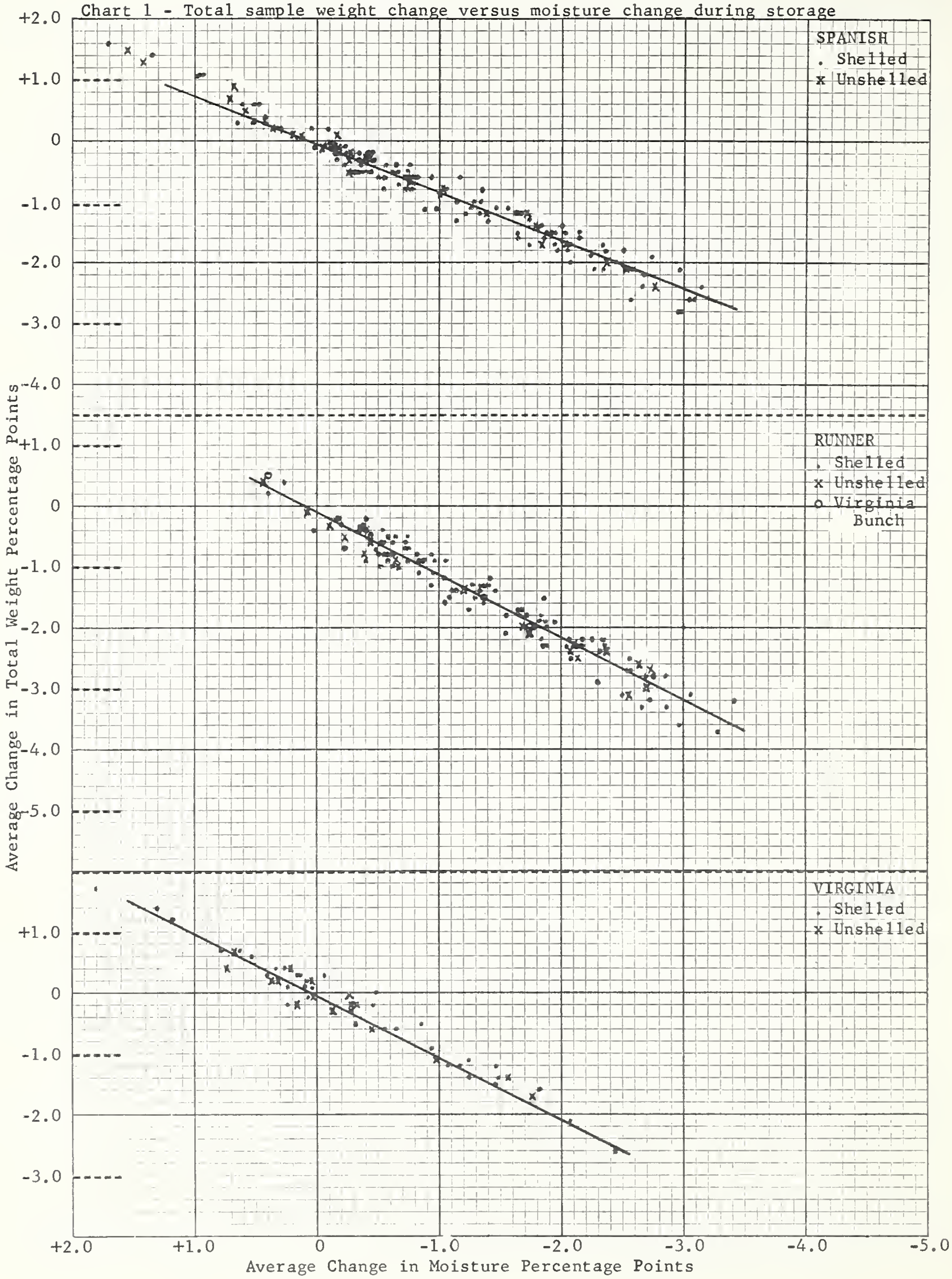
Spanish Peanuts. The "best" screen size for grading this type out of storage is the 14-7/8 slot. The 14-7/8 slot averages about 0.3 percent SMK too low for Georgia and about 0.3 percent SMK too high for Oklahoma and Texas.

Changing from 14-7/8 to any other size would not improve the 3-State correlation, because a larger opening would give too few SMK for Georgia, while a smaller opening would give too many SMK for Oklahoma and Texas. Charts 6, 7, and 8 show plottings for individual 250-gram samples.

Runner Peanuts. It is estimated that the "best" screen size for grading this type out of storage probably would be a 15-11/16 slot screen. Charts 9, 10, and 11 show that the results for the 15-3/4 slot screen are on the average 1 gram too light in SMK. Therefore, a screen with openings smaller than 15-3/4 is needed to give more ride weight for both Alabama (Chart 9) and Georgia (Chart 10). Based on the two-year data, a screen opening of 15-11/16 should give the additional ride weight needed on the average.

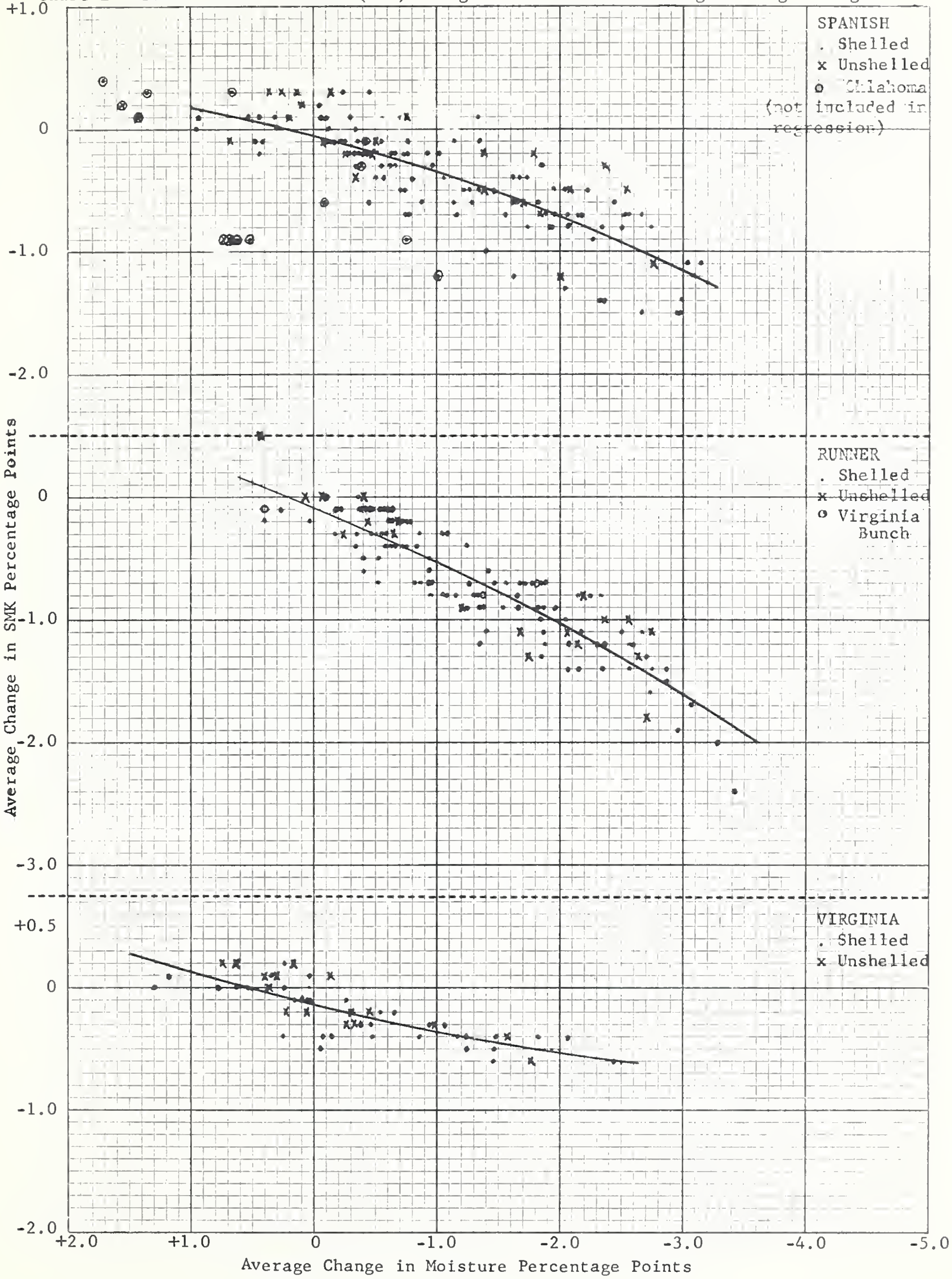
FARMERS' STOCK PEANUTS - 1958-59 and 1959-60 SEASONS

Chart 1 - Total sample weight change versus moisture change during storage



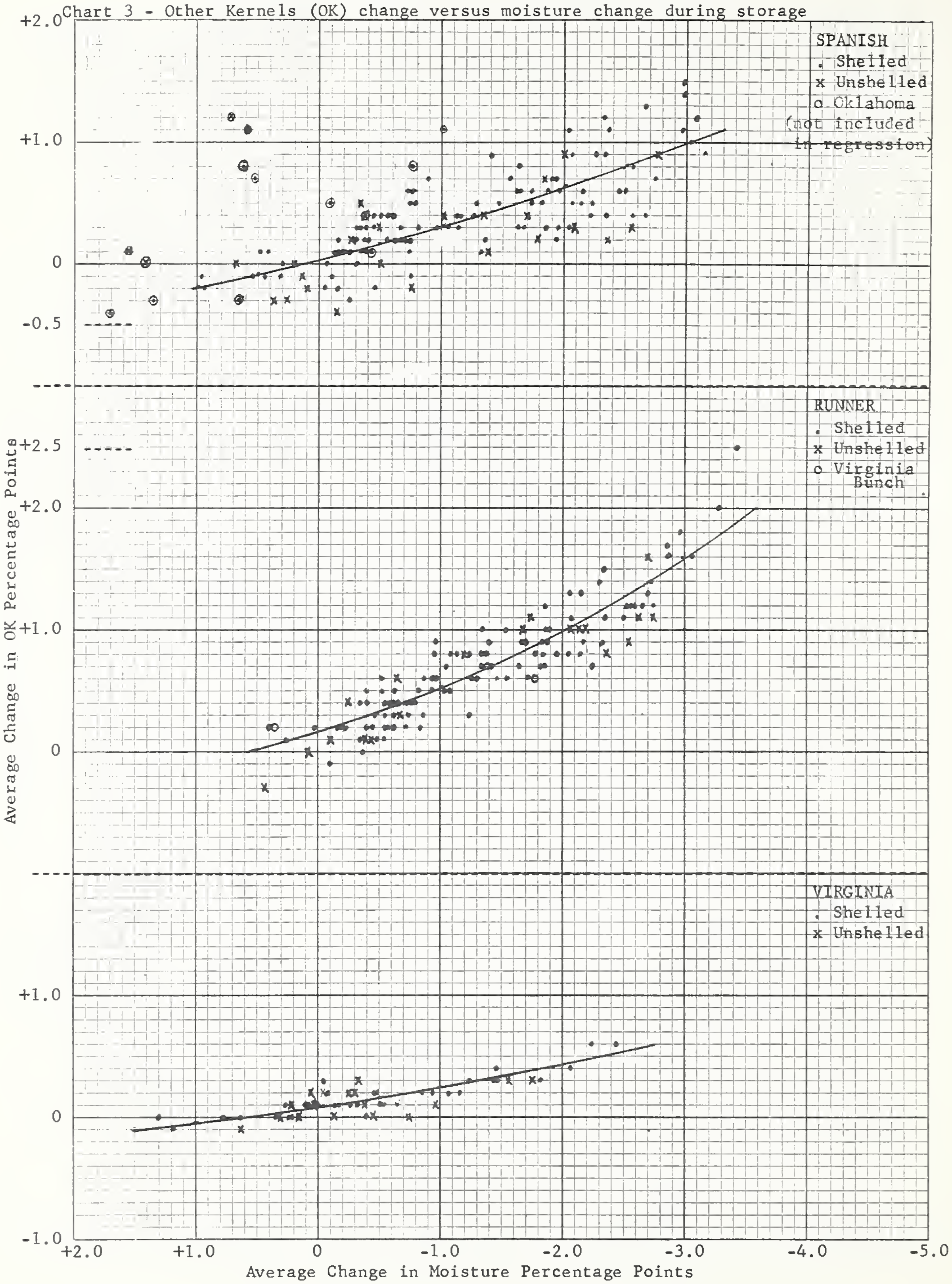
FARMERS' STOCK PEANUTS - 1958-59 and 1959-60 SEASONS

Chart 2 - Sound Mature Kernels (SMK) change versus moisture change during storage



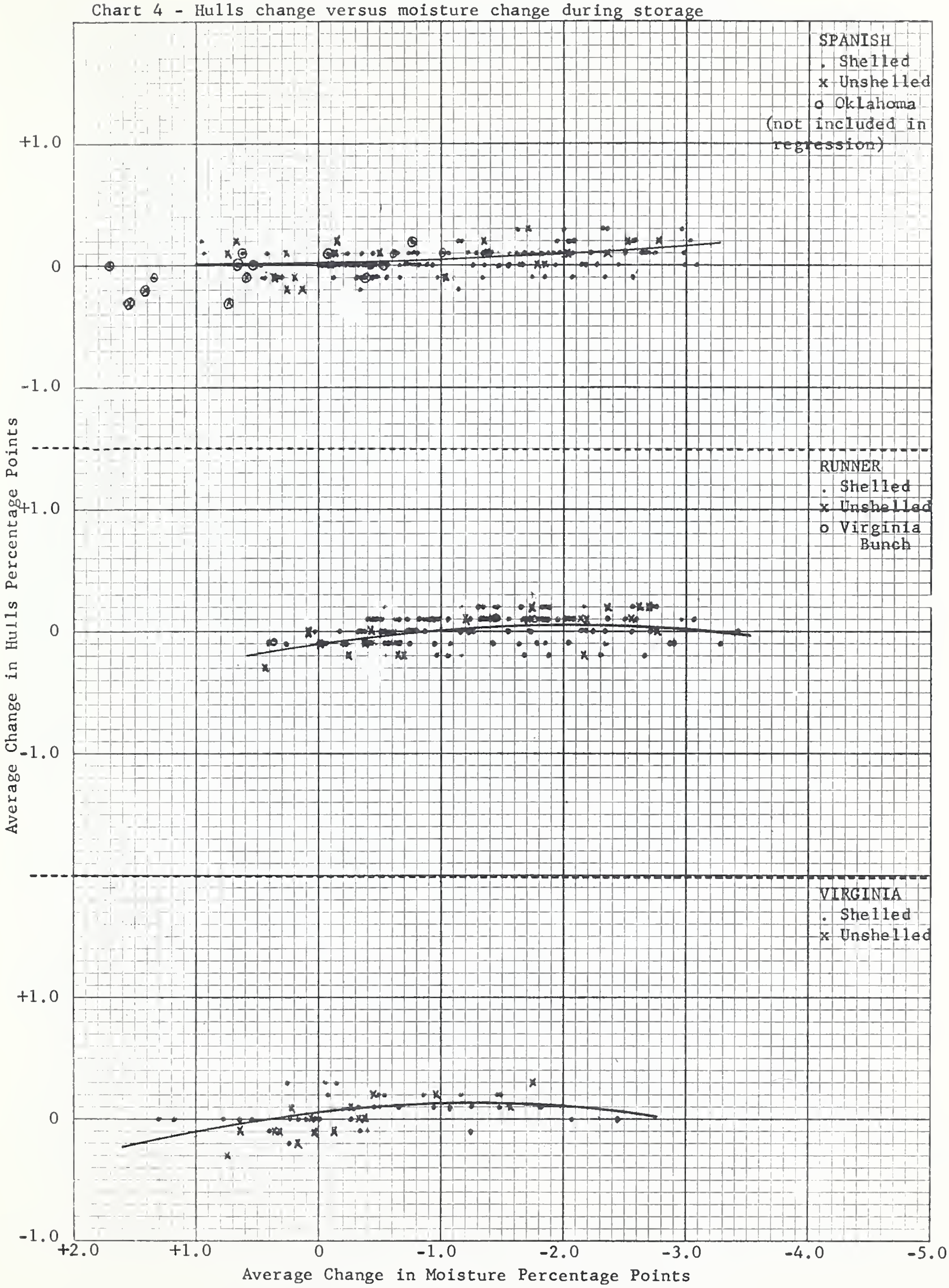
FARMERS' STOCK PEANUTS - 1958-59 and 1959-60 SEASONS

Chart 3 - Other Kernels (OK) change versus moisture change during storage



FARMERS' STOCK PEANUTS - 1958-59 and 1959-60 SEASONS

Chart 4 - Hulls change versus moisture change during storage



FARMERS' STOCK PEANUTS - 1958-59 and 1959-60 SEASONS

Chart 5 - Extra Large Kernels (ELK) change versus moisture change during storage

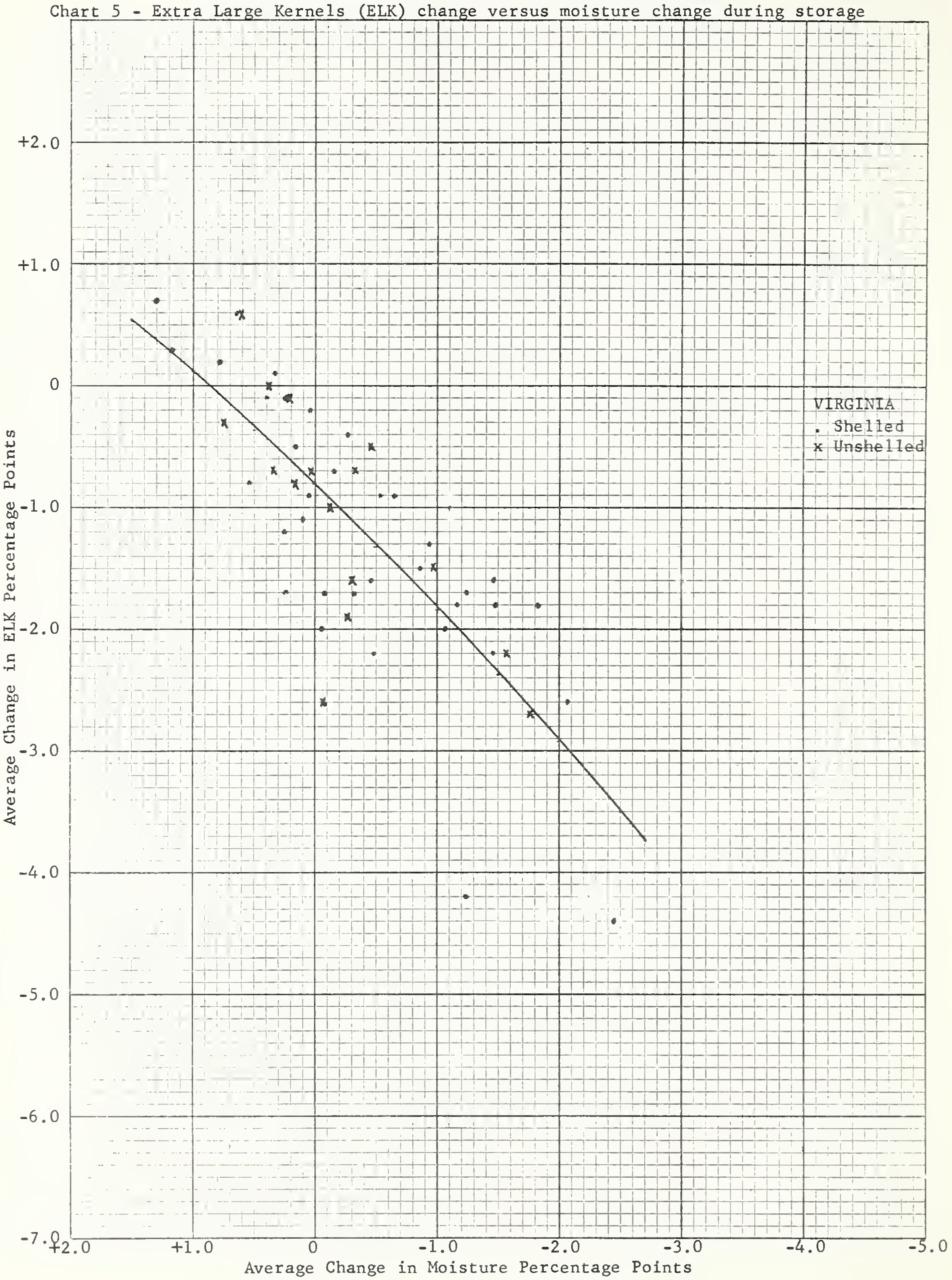


Chart 6 - Correlation between calculated weight of SMK after storage and actual weight of kernels riding 14-7/8 slot screen after storage.

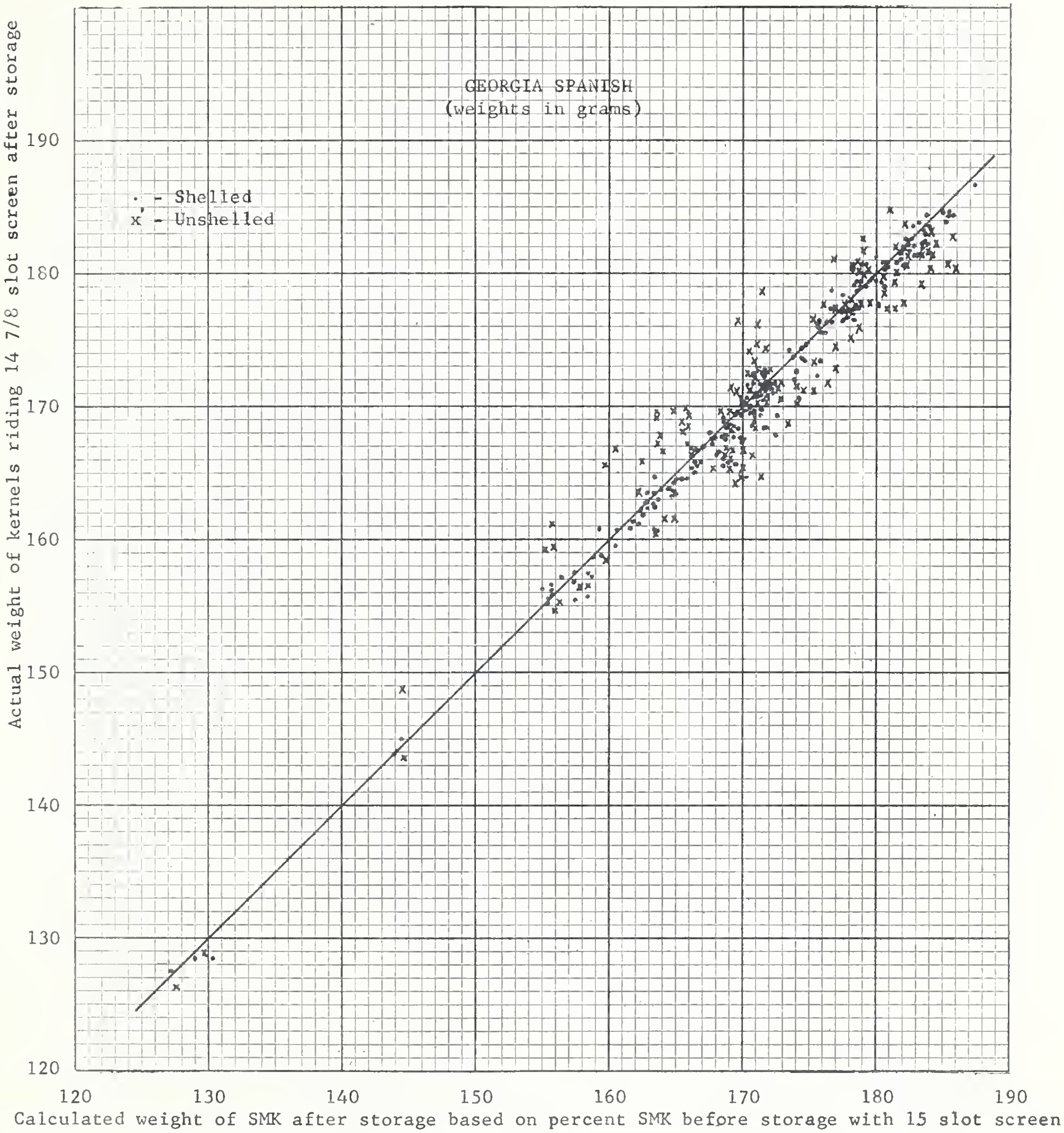


Chart 7 - Correlation between calculated weight of SMK after storage and actual weight of kernels riding 14-7/8 slot screen after storage.

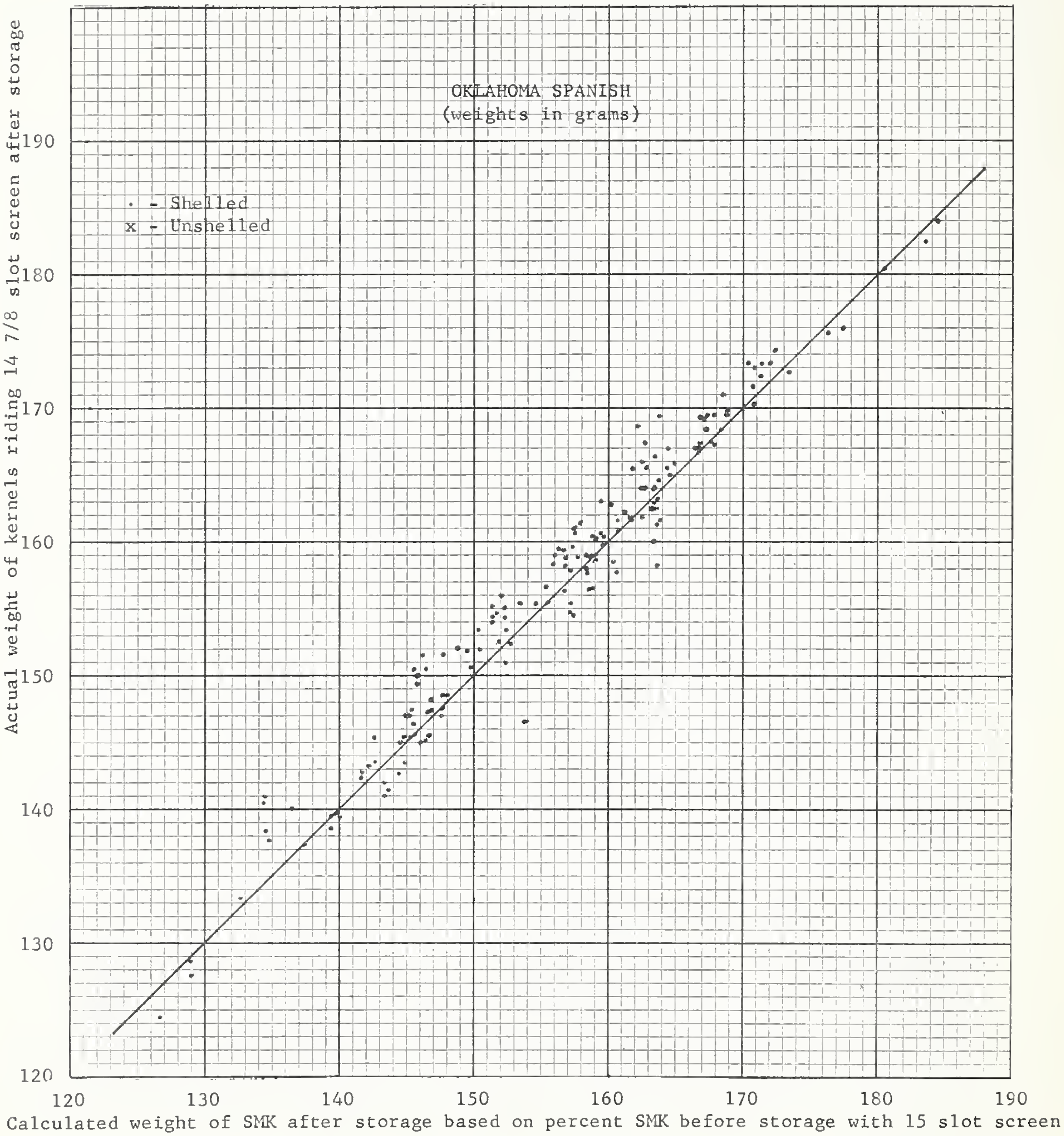


Chart 8 - Correlation between calculated weight of SMK after storage and actual weight of kernels riding 14-7/8 slot screen after storage.

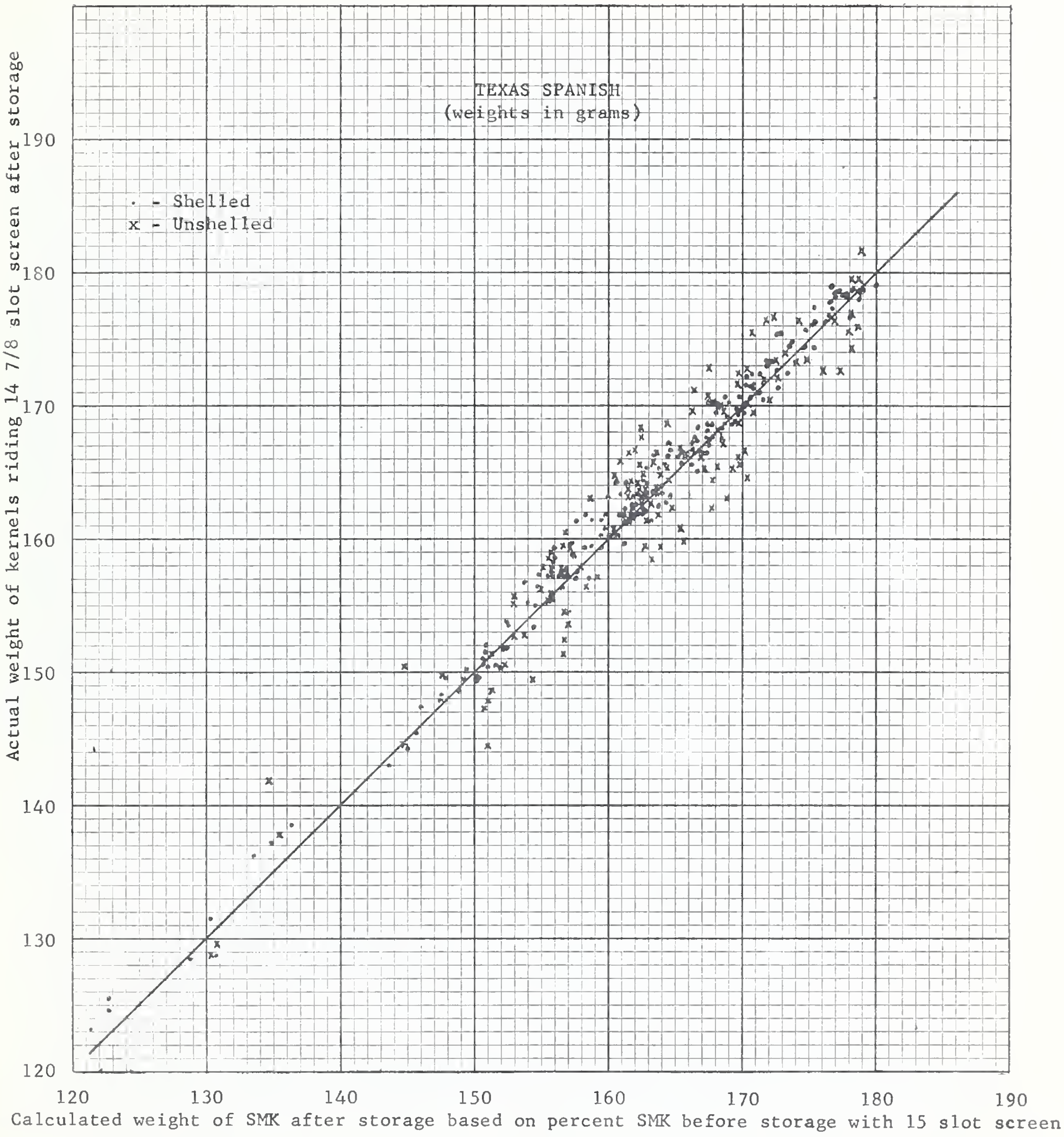


Chart 9 - Correlation between calculated weight of SMK after storage and actual weight of kernels riding 15-3/4 slot screen after storage.

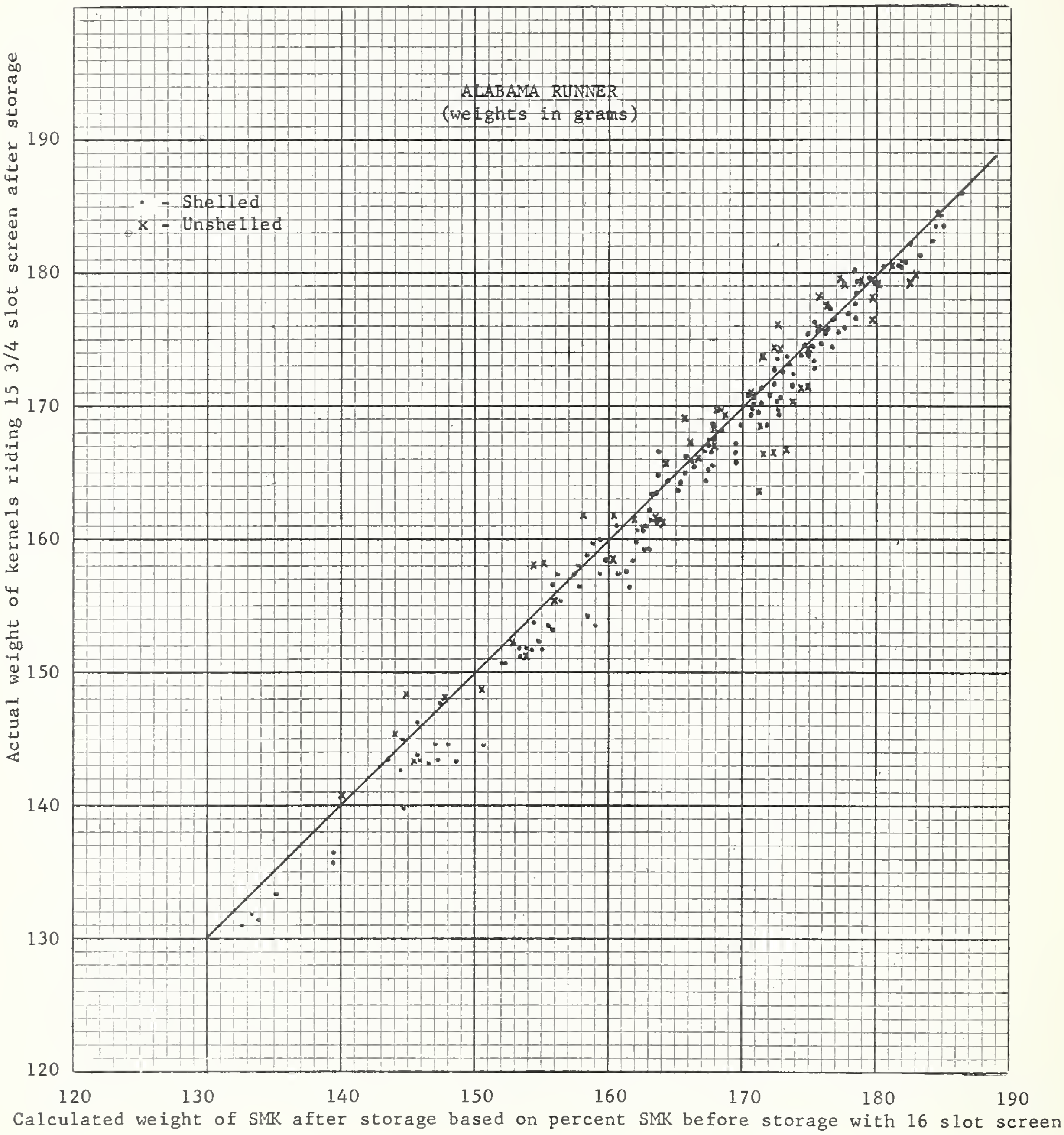
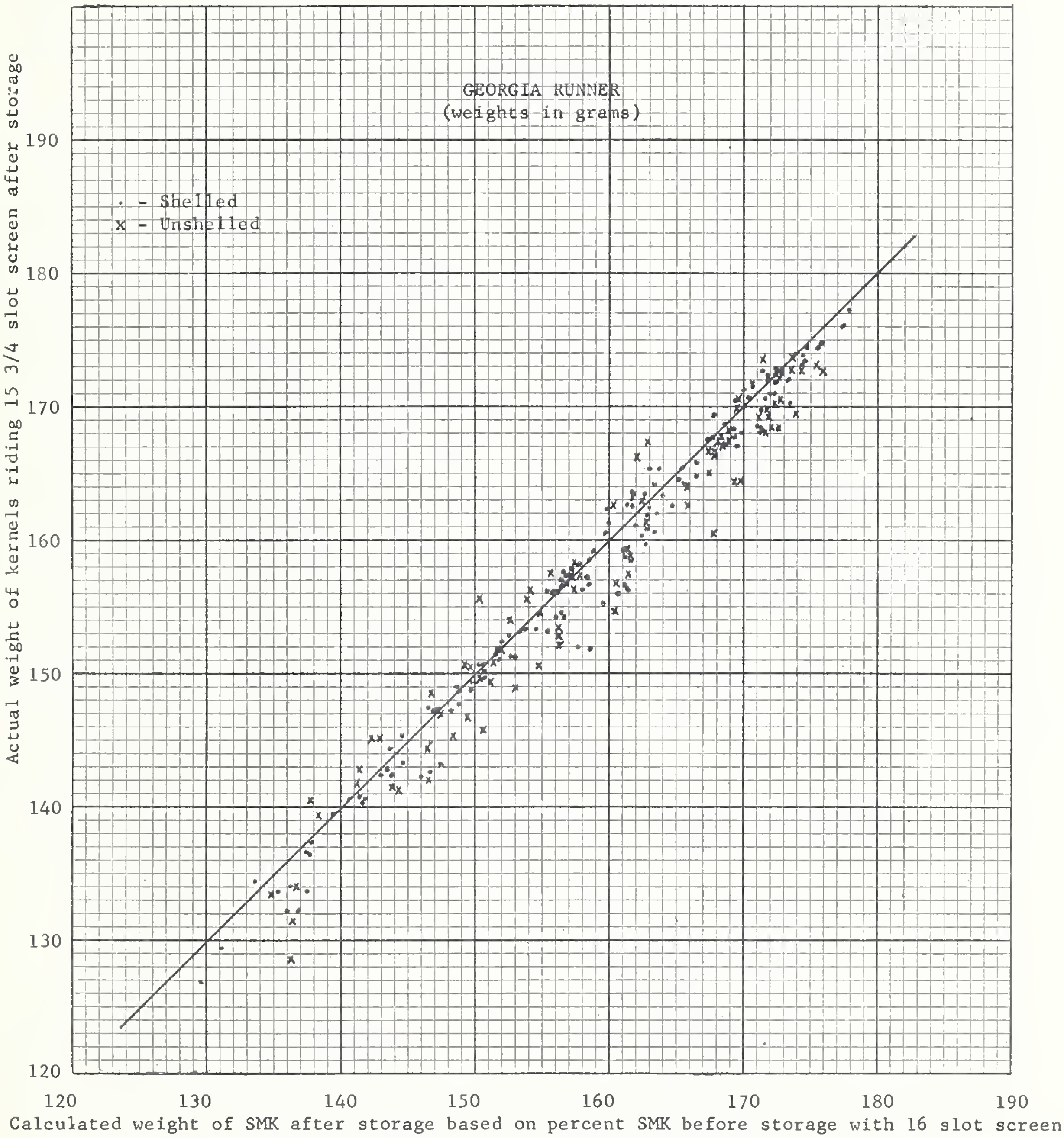


Chart 10 - Correlation between calculated weight of SMK after storage and actual weight of kernels riding 15-3/4 slot screen after storage.



FARMERS' STOCK PEANUTS - 1958-59 and 1959-60 SEASONS

Chart 11 - Correlation between calculated weight of SMK after storage and actual weight of kernels riding 15-3/4 slot screen after storage.

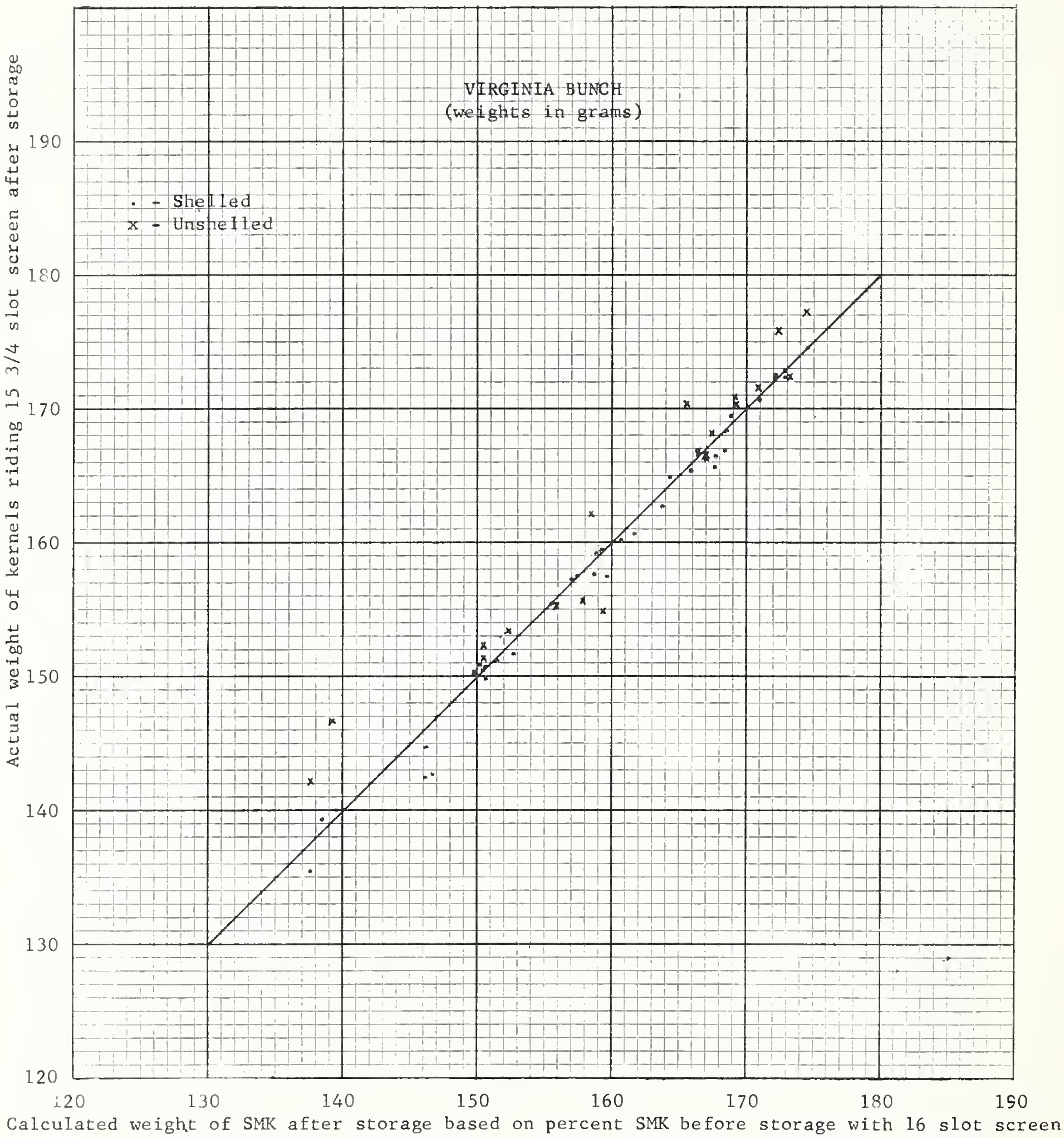


TABLE 1.--Averages of sample characteristics of Spanish peanuts by year and number of days in storage.

State and drying method	Item	1958 -- Number of days in storage 1	2	3	5	9	17	17[1]	33	65
Georgia-Windrowed	Number of samples	61	61	60	59	53	53	-	-	-
	Percent moisture	8.00	6.94	6.23	5.34	5.01	5.13	-	-	-
	Percent hulls	21.9	22.0	22.0	22.0	21.9	21.9	-	-	-
	Percent SMK	70.9	70.5	70.4	70.1	69.8	69.8	-	-	-
	Percent OK	7.2	7.5	7.6	7.9	8.3	8.4	-	-	-
	Total weight	249.1	247.2	245.6	244.2	242.9	242.5	-	-	-
Georgia-Stacked	Number of samples	33	33	33	32	32	32	-	-	-
	Percent moisture	6.54	6.33	6.25	5.96	5.72	5.57	-	-	-
	Percent hulls	21.6	21.6	21.6	21.5	21.5	21.7	-	-	-
	Percent SMK	70.3	70.2	70.1	69.9	69.8	69.7	-	-	-
	Percent OK	8.1	8.2	8.3	8.6	8.7	8.9	-	-	-
	Total weight	249.7	248.8	248.4	248.0	247.6	246.8	-	-	-
Texas-Windrowed	Number of samples	139	139	139	138	137	131	131	93	89
	Percent moisture	8.11	7.38	6.71	6.10	5.45	5.13	5.36	5.08	4.99
	Percent hulls	24.7	24.8	24.8	24.9	24.8	24.9	25.0	25.1	25.0
	Percent SMK	65.2	64.5	64.2	63.9	63.7	63.4	63.9	62.6	63.3
	Percent OK	10.1	10.7	11.0	11.2	11.4	11.7	11.1	12.3	11.7
	Total weight	249.5	247.6	246.3	245.1	243.5	242.4	243.4	242.5	242.9
Texas-Mechanical	Number of samples	32	32	32	30	25	29	28	-	18
	Percent moisture	7.63	7.20	6.85	6.08	5.53	5.37	5.28	-	4.73
	Percent hulls	25.9	25.9	26.0	26.1	26.4	26.2	26.2	-	26.1
	Percent SMK	61.3	60.7	60.6	60.2	58.5	59.4	59.9	-	59.5
	Percent OK	12.9	13.3	13.4	13.7	15.1	14.4	13.9	-	14.4
	Total weight	249.5	248.9	248.0	246.4	244.9	245.3	246.0	-	244.4

State and drying method	Item	1959 -- Number of days in storage 1	33	65	65[1]	97	97[1]
Georgia-Windrowed	Number of samples	127	127	127	33	33	33
	Percent moisture	8.43	5.86	5.75	5.93	6.26	6.11
	Percent hulls	24.2	24.4	24.3	24.4	24.3	24.3
	Percent SMK	69.4	68.7	68.7	69.1	69.1	69.3
	Percent OK	6.5	6.9	6.9	6.5	6.6	6.4
	Total weight	249.3	244.1	243.9	244.0	244.6	244.3
Georgia-Mechanical	Number of samples	156	156	156	36	36	-
	Percent moisture	7.77	5.82	5.75	5.92	6.10	-
	Percent hulls	23.7	23.9	23.9	23.7	23.8	-
	Percent SMK	69.7	69.2	69.3	69.5	69.3	-
	Percent OK	6.6	6.9	6.9	6.8	6.9	-
	Total weight	249.7	246.0	245.9	246.4	246.7	-
Texas-Windrowed	Number of samples	228	228	228	-	227	54
	Percent moisture	7.99	5.42	6.35	-	5.91	6.08
	Percent hulls	24.2	24.1	24.2	-	24.1	23.9
	Percent SMK	65.9	65.2	65.3	-	65.1	65.5
	Percent OK	9.9	10.7	10.5	-	10.8	10.6
	Total weight	249.9	243.5	246.2	-	244.9	245.6
Texas-Mechanical	Number of samples	51	51	51	-	51	-
	Percent moisture	7.42	5.28	6.24	-	5.69	-
	Percent hulls	23.7	23.7	23.9	-	23.8	-
	Percent SMK	65.7	65.0	65.0	-	64.9	-
	Percent OK	10.7	11.2	11.1	-	11.3	-
	Total weight	250.2	246.1	248.9	-	247.0	-

(Continued)

TABLE 1.--Averages of sample characteristics of Spanish peanuts by year and number of days in storage (Continued).

State and drying method	Item	1959 -- Number of days in storage					
		1	33	65	65[1]	97	97[1]
Oklahoma-Windrowed	Number of samples	153	153	143	36	40	36
	Percent moisture	7.97	6.96	8.63	8.53	8.32	8.39
	Percent hulls	23.9	24.0	24.0	23.5	23.7	23.7
	Percent SMK	65.7	64.5	65.0	65.6	65.8	65.5
	Percent OK	10.4	11.5	11.0	10.9	10.4	10.8
	Total weight	249.6	247.4	251.1	251.3	251.1	250.8
Oklahoma-Mechanical	Number of samples	78	77	78	-	-	-
	Percent moisture	8.04	7.28	7.95	-	-	-
	Percent hulls	22.8	23.0	22.9	-	-	-
	Percent SMK	64.9	64.1	64.3	-	-	-
	Percent OK	12.3	12.9	12.8	-	-	-
	Total weight	249.7	248.7	250.1	-	-	-

[1] Unshelled samples.

TABLE 2.--Averages of sample characteristics of Virginia Bunch peanuts by year and number of days in storage.

State and drying method	Item	1959 -- Number of days in storage		
		1	33	65
Georgia-Windrowed	Number of samples	38	38	38
	Percent moisture	7.60	5.83	6.23
	Percent hulls	28.1	28.2	28.2
	Percent SMK	65.0	64.3	64.2
	Percent OK	6.9	7.5	7.6
	Total weight	249.1	244.2	245.4

TABLE 3.--Averages of sample characteristics of Runner peanuts by year and number of days in storage.

State and drying method	Item	1958 -- Number of days in storage								
		1	2	3	5	9	17	17[1]	33	65
Georgia-Windrowed	Number of samples	231	230	231	230	225	223	25	103	-
	Percent moisture	8.09	7.24	6.63	5.92	5.40	5.43	5.55	5.74	-
	Percent hulls	25.9	26.0	26.1	26.1	26.1	26.1	25.7	25.2	-
	Percent SMK	64.4	64.1	63.7	63.3	63.0	62.8	63.0	63.4	-
	Percent OK	9.7	9.9	10.2	10.6	10.9	11.1	11.3	11.4	-
	Total weight	248.8	246.6	245.2	243.4	241.9	240.9	241.5	239.5	-
Georgia-Stacked	Number of samples	19	19	19	19	19	19	-	-	-
	Percent moisture	7.08	6.64	6.47	6.13	5.76	5.55	-	-	-
	Percent hulls	25.8	25.9	25.9	25.9	25.9	25.8	-	-	-
	Percent SMK	63.9	63.6	63.4	63.0	63.0	62.9	-	-	-
	Percent OK	10.3	10.5	10.7	11.1	11.1	11.3	-	-	-
	Total weight	248.7	247.4	246.8	245.9	245.2	243.6	-	-	-
Alabama-Windrowed	Number of samples	79	79	78	79	79	75	74	-	50
	Percent moisture	8.07	7.48	7.01	6.67	6.18	5.50	5.70	-	5.02
	Percent hulls	25.7	25.7	25.8	25.8	25.9	25.9	25.9	-	26.2
	Percent SMK	63.5	63.1	62.6	62.5	62.3	62.1	62.6	-	61.3
	Percent OK	10.8	11.2	11.6	11.7	11.8	12.0	11.5	-	12.5
	Total weight	248.8	247.6	246.6	245.5	243.9	242.0	242.9	-	241.4
Alabama-Stacked	Number of samples	65	65	65	65	64	64	64	22	30
	Percent moisture	7.90	7.50	6.97	6.57	5.83	5.19	5.27	4.69	4.87
	Percent hulls	25.9	26.0	26.0	26.1	26.0	25.9	26.0	25.6	25.6
	Percent SMK	63.7	63.2	63.1	62.5	62.3	62.4	62.4	61.8	62.2
	Percent OK	10.4	10.8	10.9	11.4	11.7	11.7	11.6	12.6	12.2
	Total weight	248.5	247.4	246.4	245.3	243.0	241.5	242.0	240.2	239.3

State and drying method	Item	1959 -- Number of days in storage					
		1	33	65	65[1]	97	97[1]
Georgia-Windrowed	Number of samples	138	138	138	24	29	25
	Percent moisture	7.97	6.16	6.14	5.91	5.55	5.53
	Percent hulls	26.3	26.5	26.4	26.3	26.4	26.3
	Percent SMK	65.1	64.2	64.1	64.3	63.9	64.4
	Percent OK	8.6	9.3	9.5	9.4	9.7	9.3
	Total weight	248.8	244.0	243.4	242.6	241.2	241.2
Georgia-Mechanical	Number of samples	74	74	74	19	19	19
	Percent moisture	7.59	5.94	6.22	5.97	5.58	5.59
	Percent hulls	26.3	26.5	26.4	25.8	25.8	25.8
	Percent SMK	64.0	63.2	63.1	64.2	64.1	64.2
	Percent OK	9.7	10.4	10.5	10.0	10.1	10.0
	Total weight	249.3	245.2	245.3	244.4	243.1	243.3
Alabama- Windrowed	Number of samples	117	117	117	25	-	-
	Percent moisture	7.94	5.38	5.79	5.70	-	-
	Percent hulls	26.4	26.5	26.4	25.9	-	-
	Percent SMK	67.8	66.5	66.5	67.3	-	-
	Percent OK	5.8	7.0	7.1	6.8	-	-
	Total weight	247.8	241.7	242.2	242.3	-	-
Alabama-Stacked	Number of samples	115	115	50	-	-	-
	Percent moisture	7.88	5.93	4.89	-	-	-
	Percent hulls	25.0	25.1	25.3	-	-	-
	Percent SMK	69.2	68.3	67.7	-	-	-
	Percent OK	5.8	6.6	7.0	-	-	-
	Total weight	249.0	244.3	240.8	-	-	-
Alabama-Mechanical	Number of samples	107	107	104	21	-	-
	Percent moisture	7.71	5.86	5.32	5.29	-	-
	Percent hulls	25.9	26.1	26.1	25.9	-	-
	Percent SMK	68.2	67.3	66.9	68.1	-	-
	Percent OK	5.9	6.6	7.0	6.0	-	-
	Total weight	249.1	245.3	243.5	242.5	-	-

[1] Unshelled samples

TABLE 4.--Averages of sample characteristics of Virginia peanuts by year and number of days in storage.

State and drying method	Item	1958 -- Number of days in storage					
		1	3	9	17	17[1]	33[1]
N. Carolina-Stacked	Number of samples	110	110	110	110	16	-
	Percent moisture	8.46	7.93	7.28	7.00	6.46	-
	Percent hulls	27.6	27.8	27.9	27.9	28.0	-
	Percent SMK	68.6	68.3	68.1	68.0	67.8	-
	Percent OK	3.8	3.9	4.0	4.1	4.2	-
	Total weight	248.3	246.9	245.3	244.6	244.4	-
	Percent ELK	28.7	27.8	26.9	26.5	28.9	-
Virginia-Stacked	Number of samples	-	-	-	-	25	25
	Percent moisture	-	-	-	-	5.25	4.94
	Percent hulls	-	-	-	-	28.5	28.5
	Percent SMK	-	-	-	-	68.0	67.7
	Percent OK	-	-	-	-	3.5	3.8
	Total weight	-	-	-	-	237.6	237.2
	Percent ELK	-	-	-	-	34.3	33.6
		1959 -- Number of days in storage					
		1	33	65	65[1]	97	97[1]
Georgia-Windrowed	Number of samples	70	69	70	-	-	-
	Percent moisture	8.02	6.22	6.53	-	-	-
	Percent hulls	28.4	28.5	28.5	-	-	-
	Percent SMK	68.5	68.0	68.1	-	-	-
	Percent OK	3.1	3.5	3.4	-	-	-
	Total weight	249.0	245.0	245.6	-	-	-
	Percent ELK	33.0	31.0	31.2	-	-	-
Georgia-Mechanical	Number of samples	82	82	81	24	24	-
	Percent moisture	7.68	6.20	6.44	6.19	5.69	-
	Percent hulls	27.2	27.4	27.3	27.4	27.3	-
	Percent SMK	69.4	68.9	68.9	68.9	68.9	-
	Percent OK	3.4	3.7	3.8	3.7	3.8	-
	Total weight	249.6	246.5	246.8	246.0	244.2	-
	Percent ELK	31.6	30.0	29.8	29.7	29.3	-
N. Carolina-Stacked	Number of samples	101	101	99	-	26	22
	Percent moisture	8.66	7.80	8.19	-	8.39	8.65
	Percent hulls	26.1	26.3	26.2	-	26.3	26.1
	Percent SMK	71.4	71.0	71.1	-	71.0	70.9
	Percent OK	2.5	2.7	2.7	-	2.7	3.0
	Total weight	248.9	247.7	248.3	-	248.8	248.6
	Percent ELK	28.1	26.6	26.6	-	25.9	25.7
N. Carolina-Mech.	Number of samples	102	101	102	29	29	29
	Percent moisture	7.97	7.83	7.88	7.69	7.90	8.03
	Percent hulls	25.6	25.9	25.8	26.3	26.4	26.2
	Percent SMK	71.8	71.4	71.4	71.0	70.8	71.1
	Percent OK	2.6	2.7	2.8	2.7	2.8	2.7
	Total weight	249.1	249.8	249.7	249.1	250.0	249.6
	Percent ELK	28.8	28.0	27.1	28.9	28.8	28.2
Virginia-Stacked	Number of samples	225	225	223	56	56	56
	Percent moisture	8.48	7.40	8.19	8.52	8.72	9.15
	Percent hulls	26.9	27.0	27.0	27.1	27.4	27.0
	Percent SMK	70.7	70.4	70.4	70.5	69.9	70.7
	Percent OK	2.4	2.6	2.6	2.4	2.7	2.3
	Total weight	249.7	246.8	248.5	248.6	250.6	250.4
	Percent ELK	31.1	29.1	29.3	30.1	30.0	30.7
Virginia-Mechanical	Number of samples	49	49	47	-	-	-
	Percent moisture	8.11	5.68	6.87	-	-	-
	Percent hulls	27.6	27.6	27.5	-	-	-
	Percent SMK	69.9	69.3	69.5	-	-	-
	Percent OK	2.5	3.1	3.0	-	-	-
	Total weight	249.7	243.3	246.3	-	-	-
	Percent ELK	32.6	28.2	28.3	-	-	-

[1] Unshelled samples

Table 5.--Regression equations used to derive curves on Charts 1 thru 5.

Identity	Variety	Equation	n 1/	s 2/	R 3/
Chart 1 - Y = Average change in total weight percentage points X = Average change in moisture percentage points	Spanish	$Y = -.06 + .79X$	124	±.25	.96
	Runner	$Y = -.12 + 1.03X$	118	±.22	.97
	Virginia	$Y = .003 + .96X$	51	±.21	.97
Chart 2 - Y = Average change in SMK percentage points X = Average change in moisture percentage points	Spanish	$Y = -.03 + .27X - .04X^2$	124	±.25	.83
	Runner	$Y = -.08 + .42X - .03X^2$	118	±.21	.91
	Virginia	$Y = -.13 + .24X + .02X^2$	51	±.14	.79
Chart 3 - Y = Average change in OK percentage points X = Average change in moisture percentage points	Spanish	$Y = .04 - .25X + .02X^2$	124	±.23	.80
	Runner	$Y = .15 - .30X + .06X^2$	118	±.19	.91
	Virginia	$Y = .10 - .14X + .01X^2$	51	±.09	.83
Chart 4 - Y = Average change in hulls percentage points X = Average change in moisture percentage points	Spanish	$Y = .003 - .02X + .01X^2$	124	±.11	.39
	Runner	$Y = -.09 - .15X - .04X^2$	118	±.11	.40
	Virginia	$Y = .05 - .11X - .04X^2$	51	±.12	.48
Chart 5 - Y = Average change in ELK percentage points X = Average change in moisture percentage points	Virginia	$Y = -.82 + .97X - .04X^2$	51	±.68	.79

1/ n = the number of averages used in computing the regression

2/ s = the standard error of estimate

3/ R = the correlation coefficient